

We claim:-

1. A process for the preparation of an aqueous polymer dispersion by reacting at least one olefin in the presence of at least one polymerization catalyst and one emulsifier in an aqueous medium, wherein the polymerization catalyst is produced in an in situ reaction by reacting the ligand compound 2,6-dichloro-para-benzoquinone (Ia) and/or 2,3,6-trichloro-para-benzoquinone (Ib)

with a phosphine compound PR_3' , where R' is hydrogen, C_1 - C_{12} -alkyl, C_3 - C_{12} -cycloalkyl, C_7 - C_{15} -aralkyl or C_6 - C_{14} -aryl,

or with a diphosphine compound $R_2'P-G-PR_2'$, where R' has the same meanings as in the phosphine compounds PR_3' and G is a divalent radical, such as C_1 - C_{12} -alkylene, C_3 - C_{12} -cycloalkylene, C_7 - C_{15} -aralkylene or C_6 - C_{14} -arylene,

and with a metal compound of the formula $M(L^2)_2$ or $M(L^2)_2(L^1)_z$,

where:

M is a transition metal of groups 7 to 10 of the Periodic Table of the Elements,

L^1 are phosphanes $(R^1)_xPH_{3-x}$ or amines $(R^1)_xNH_{3-x}$ having identical or different radicals R^1 , diamines, ethers $(R^1)_2O$, water, alcohols $(R^1)OH$, pyridine, pyridine derivatives of the formula $C_5H_{5-x}(R^1)_xN$, carbon monoxide, C_1 - C_{12} -alkylnitriles, C_6 - C_{14} -arylnitriles or ethylenically unsaturated double bond systems, where x is an integer from 0 to 3,

R^1 is hydrogen or C_1 - C_{20} -alkyl, which in turn may be substituted by $O(C_1$ - C_6 -alkyl) or $N(C_1$ - C_6 -alkyl) $_2$, or is C_3 - C_{12} -cycloalkyl, C_7 - C_{15} -aralkyl or C_6 - C_{14} -aryl,

L^2 are halide ions, $R^2_xNH_{3-x}$, where x is an integer from 0 to 3 and R^2 is C_1 - C_{12} -alkyl, and furthermore C_1 - C_6 -alkyl anions, allyl anions, benzyl anions or aryl anions, where L^1 and L^2 may be linked to one another by one or more covalent bonds,

z is from 0 to 4,

and the polymerization of the at least one olefin is effected in an aqueous medium which comprises at least 50% by volume of water.

2. The process according to claim 1, wherein the polymerization is effected under the conditions of an aqueous miniemulsion polymerization.
3. The process according to claim 1 or 2, wherein the polymerization is effected in the presence of an anionic emulsifier.
4. The process according to any of claims 1 to 3, wherein the polymerization is effected in the presence of ethylene.
5. The process according to claim 4, wherein, in addition to ethylene, at least one further olefin which is selected from the group consisting of propylene, 1-butene, 1-hexene, 1-octene, norbornene and styrene is used for the polymerization.
6. The process according to claim 4, wherein exclusively ethylene is used for the polymerization.